

Water System Modeling Requirements

A water system model will be required on all final plan reviews. The following guidelines are provided in addition to the attached pressure zone map which specifies the proposed pressures for design in all areas in the city.

Culinary Water Flow / Demand Assumptions:

Flow Demand Condition	2003 Master Plan Value Developed from Existing Flow Data	Utah State Division of Drinking Water Recommended Value	Recommended Value for Development Approval modeling **
Average Daily (ADF)	280 gal / ERU / day or 0.1944 gpm /ERU	N/A	280 gal / ERU / day or 0.1944 gpm /ERU
Peak Daily (PDF)	590 gal / ERU / day or 0.4097 gpm /ERU	800 gal / ERU / day or 0.5556 gpm / ERU	800 gal / ERU / day or 0.5556 gpm / ERU
Peak Instantaneous (PIF)	896 gal / ERU / day or 0.6222 gpm / ERU	$Q=10.8 (N)^{0.64}$ $Q=PIF$ in gpm, $N = ERU$	$Q=10.8 (N)^{0.64}$ $Q=PIF$ in gpm, $N = ERU$

** The values contained within the 2003 Master Plan were developed directly from Source data supplied by JVVCD. The Utah State Division of Drinking Water Values are contained within current state regulations. We are recommending the more conservative values in consideration of the fact that most developments under review will tend to be small in nature, and therefore warrant a more conservative approach.

Irrigation Water Flow Demand Assumptions:

Flow Demand Condition	2003 Master Plan Value Developed from Existing Flow Data	Utah State Division of Drinking Water Recommended Value	Recommended Value for Development Approval modeling ***
Average Daily (ADF) Assumes 3-ft, 7 months	3.23 gpm / Acre	N/A	3.23 gpm / Acre
Peak Daily (PDF)	3.96 gpm / Acre	3.96 gpm / Acre	3.96 gpm / Acre
Peak Instantaneous (PIF)	7.92 gpm / Acre	7.92 gpm / Acre	7.92 gpm / Acre
Peak Instantaneous w/ City Peaking (CPIF) *****	11.88 gpm / Acre	11.88 gpm / Acre	11.88 gpm / Acre

*** The values contained within the 2003 Secondary Water Study were utilized as noted.

**** Average Daily Flow assumes 3-feet per Acre over 210 day season.

***** South Jordan City recommends night-time irrigation. Accordingly 1.5 peaking factor has been applied on top of traditional PIF flow condition.

Fire Flow Demand Assumptions:

Fire Flow Demand Condition	Required Flow	Required Duration
Small Residential (< 3600 SF)	1000 gpm	2 hours
Large Residential (> 3600 SF)	1750 gpm	2 hours
Other Uses	As determined by Fire Marshal on a case by case basis.	As determined by Fire Marshal on a case by case basis.

Non-residential ERU Assumptions per Land Use Type:

In some instances there could be a land use type incorporated within a development that will require consideration within demand allocations. For example, a park or open space area contained within a residential development. In order to consider these types of uses, the following ERU conversion table is provided to estimate culinary only flows. Irrigation demands for these types of uses will be based upon the overall irrigable acreage as determined by City staff.

Future Land Use Designation	Projected Average Density (ERU's / Acre)
R-M (High Density Residential)	Development Specific
IF/CI (Commercial)	0.33
IF / CI (Industrial Parkway)	0.33
A (Recreation / Open Space)	0.10
MU/H (Mixed Use / Historical)	3.00
PC (Large Master Planned Com)	0.33
BP (Business Park)	2.00
OS (Office Space)	2.00
P (Public / Semi Public)	0.50

Demand Summation:

For purposes of compiling the projected demand of any given development, calculate and compile the demand associated with each component noted above. The developer must provide a spreadsheet summary that identifies each demand component and sums the total demand components for each flow condition required for modeling.

Flow Modeling Assumptions:

At a minimum, each development will be required to provide a hydraulic flow model for the development under consideration. This hydraulic model must be compiled in a data format compatible with EPANET version 2.0. This model was chosen for use by the City due to the fact that it is public domain software and may be acquired free of charge. In order to obtain the software, please access one of the two sources below:

- 1) This software is available online at the following URL:
<http://www.epa.gov/ORD/NRMRL/wswrd/epanet.html>
- 2) The software is also available on CD from the South Jordan City Water Division at a cost of \$5.00 (to cover the cost of reproduction).

In order to complete the flow modeling, there are two conditions that will need to be modeled. These are summarized as follows:

- 1) Peak Instantaneous Flow condition for all water uses within the proposed development.
- 2) Peak Daily Flow condition(s) with a simulated fire applied at all dead end pipe conditions, the furthest extremes of proposed pipe network, or at other locations requested by either the City Fire Marshall or Water Division personnel.

In completing the modeling, the development engineer will need to demonstrate that a number of conditions are met with the original model.

- 1) Demonstrate that dynamic pressures within any portion of the pipe network do not drop below 25 psi at any time.
- 2) For all pipe networks where the source node pressure is less than or equal to 50 psi demonstrate that the proposed pipe network friction losses do not exceed 5 psi as compared to the city provided source node pressure.
- 3) For all pipe networks where the source node pressure is greater than 50 psi demonstrate that the proposed pipe network friction losses do not exceed 10 psi as compared to the city provided source node pressure.

Modeling Instructions:

In order to conduct hydraulic modeling, the development engineer will be provided a city supplied source node and assumed dynamic pressure at that location. For purposes of stand alone modeling the development engineer can

assume that this source node serves as a fixed grade node or tank supply. The development engineer will need to establish a hydraulic model with Pipe numbers and node numbers as provided and issued by the City Water Division (801) 253-5230. Hydraulic modeling results will be provided to the City as part of the development review submittal. Upon receipt of development hydraulic model, City staff will integrate this model within the overall City system model and remodel proposed development to ensure that proposed hydraulic conditions noted above are maintained. In the event that development creates additional upstream impacts from the City supplied source node, the development engineer may be required to work with the City to identify appropriate system improvements to adequately serve development needs.